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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,227	11/17/2003	Zhiping Yin	3657.SUS (98-0265.05/US)	5021

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EXAMINER

LEWIS, MONICA

ART UNIT PAPER NUMBER

2822

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,227

Applicant(s)

YIN, ZHIPING

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to the amendment filed December 16, 2004.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-3, 5-10, 12 and 14 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Prior Art.

In regards to claim 1, Applicant's Prior Art discloses the following:

a) a first layer (42) comprising anti-reflective material (For Example: See Figure 4);

b) a second layer (46) comprising silicon nitride, located over the first layer, and including in-film particles (44) (For Example: See Figure 4); and

c) 1 ¼ in-film particles or surface roughness features per square millimeter of surface area (For Example: See Paragraph 9 and 36) (Note: Although the specification does not specifically disclose the limitation above, Applicant disclosed in the response that "semiconductor devices that have an imperfection density of less than about 40,000 particles of about 120-150 nm dimension per eight inch diameter... result is a maximum imperfection density of 1.27, or about 1 ¼, particles or surface roughness features per square millimeter." The prior art discloses that in-film particles have a size of about 120-150 nm and a density on the semiconductor device structure 40 of about 40,000 or more per eight inch diameter wafer.).

In regards to claims 2 and 9, Applicant's Prior Art discloses the following:

a) the anti-reflective material comprises silicon atoms and nitrogen atoms (For Example: See Paragraph 36).

In regards to claims 3 and 10, Applicant's Prior Art discloses the following:

a) the anti-reflective material further comprises oxygen atoms (For Example: See Paragraph 36).

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In regards to claims 5 and 12, Applicant's Prior Art discloses the following:

a) a surface of said the first layer is substantially free of at least one of measurable particulates and surface roughness (For Example: See Figure 4).

In regards to claim 6, Applicant's Prior Art discloses the following:

a) the second layer includes at most about 1 1/4 of at least one of particles and surface roughness features of at least about 120 nm dimension per square millimeter of surface area (For Example: See Paragraph 9 and 36) (Note: Although the specification does not specifically disclose the limitation above, Applicant disclosed in the response that "semiconductor devices that have an imperfection density of less than about 40,000 particles of about 120-150 nm dimension per eight inch diameter...result is a maximum imperfection density of 1.27, or about 1 1/4, particles or surface roughness features per square millimeter." The prior art discloses that in-film particles have a size of about 120-150 nm and a density on the semiconductor device structure 40 of about 40,000 or more per eight inch diameter wafer.).

In regards to claims 7 and 14, Applicant's Prior Art discloses the following:

a) the second layer is formed on the first layer (For Example: See Figure 4).

Finally, the following limitation makes it a product by process claim: a) "formed on."

The MPEP § 2113, states, "Even though product -by[-] process claims are limited by and defined by the process, determination of patentability is based upon the product itself. The patentability of a product does not depend on its method of production. If the product in product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product is made by a different process." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985)(citations omitted).

A "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao and Sato et al.*, 190 USPQ 15 at 17 (CCPA 1976) (footnote 3). See also *In re Brown and Saffer*, 173 USPQ 685 (CCPA 1972); *In re Luck and Gainer*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); and *In re Marosi et al.*, 218 USPQ 289 (CAFC 1983) final product per se which must be determined in a "product by, all of" claim, and

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not the patentability of the process, and that an old or obvious product, whether claimed in "product by process" claims or not. Note that Applicant has the burden of proof in such cases, as the above caselaw makes clear.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicant's Prior Art.

In regards to claims 4 and 11, Applicant's Prior Art fails to disclose the following:

a) the anti-reflective material comprises $\text{Si}_x\text{O}_y\text{N}_z$ where x equals about 0.40 to about 0.65 times the sum of x, y, and z, y equals about 0.02 to about 0.56 times the sum of x, y, and z, and z equals about 0.05 to about 0.33 times the sum of x, y, and z.

However, the applicant has not established the critical nature of "the anti-reflective material comprises $\text{Si}_x\text{O}_y\text{N}_z$ where x equals about 0.40 to about 0.65 times the sum of x, y, and z, y equals about 0.02 to about 0.56 times the sum of x, y, and z, and z equals about 0.05 to about 0.33 times the sum of x, y, and z." "The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . In such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir.1990). Therefore, it would have been

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obvious to one having ordinary skill in the art at the time the invention was made to have various ranges.

Response to Arguments

6. Applicant's arguments filed 12/16/04 have been fully considered but they are not persuasive. Applicant argued that the office has not submitted any prior art "teaching or suggestion that would tend to show a semiconductor device structure including a layer comprising silicon nitride and at most about 1 ¼ in-film particles or surface roughness features." Although the specification does not specifically disclose the limitation above, Applicant disclosed in the response that "semiconductor devices that have an imperfection density of less than about 40,000 particles of about 120-150 nm dimension per eight inch diameter...result is a maximum imperfection density of 1.27, or about 1 ¼, particles or surface roughness features per square millimeter." The prior art discloses that in-film particles have a size of about 120-150 nm and a density on the semiconductor device structure 40 of about 40,000 or more per eight inch diameter wafer. Therefore, "at most about 1 ¼ in-film particles" is anticipated by the admitted prior art which discloses 1 ¼ in film particles (For Example: See Page 9 Paragraph 36).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

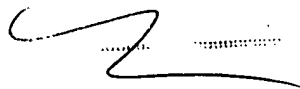
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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956

ML
March 18, 2005



Mary Wilczewski
Primary Examiner